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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,196	07/14/2006	Kunitaka Momota	101523.0001US1	7582

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EXAMINER

NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
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1793

NOTIFICATION DATE	DELIVERY MODE
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09/03/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/597,196	Applicant(s) MOMOTA ET AL.	
	Examiner Ngoc-Yen M. Nguyen	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,7,9 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 7, 9, 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 15, 2010 has been entered.

The drawings are objected to because in Figure 1, the stream coming out from tank "7" is labeled as "calcium fluoride slurry", it should be "calcium chloride slurry" instead. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

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Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 3, 7, 9, 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicants are requested to point out support in the instant specification, by page and line numbers (*not* paragraph numbers in P.G. Publication), for the following limitations:

- In claim 1, “the reaction system being maintained at pH 1.5 or lower”. It is noted that in the Examples, the pH of the mother liquid obtained after removing the calcium fluoride product has a pH of “1.2” (Example 1), “1.5” (Example 2), “not greater than 1” (Example 3), etc., but not “maintaining” the reaction system at pH 1.5 or lower. For example, at the beginning of the reacting step, the reaction pH can be at higher than 3 due to the high pH of the fluoride-containing effluent and the pH can gradually decrease so that the mother liquor obtained after the reaction had finished has a pH of

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1.5. In this case, the pH can vary from higher than 3 to 1.5 or lower, not "maintained" at pH of 1.5 or lower.

- In claim 7, "an at least 2.2% hydrofluoric acid-containing effluent". It is noted that in Example 8, 2.2% HF is disclosed and other examples disclose higher % of HF (such as 17.2% HF in Example 3), however the claimed range of "at least 2.2%" would include values higher than both "2.2%" in Example 8 and "17.2%" in Example 3, such as 19%, thus, there is no sufficient support in the instant specification for the claimed range "at least 2.2%".

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3, 7, 9, 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 7, it is unclear what is required by "and provides a produced or residual quantity of hydrochloric acid, the "produced or residual quantity of hydrochloric acid" is produced by the "reacting" step or the "produced or residual quantity of hydrochloric acid" is actually supplied from an external source.

In claims 3 and 9, there is no clear antecedent basis for "the aqueous calcium chloride solution contain hydrochloric acid".

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-130,427 in view of Johansing, Jr. (5,705,140).

JP '427 discloses a process for producing high purity calcium fluoride from a mixed acid aqueous solution obtained in the decomposition of a fluorine compounds such as fluorocarbon. The mixed acid is distilled to remove metal impurities (note abstract).

JP '427 discloses that the mixed acid contains both HF and HCl (note paragraph [001]). After the distillation step, the mixed acid solution B still contains both HF and HCl (note paragraph [0020]). Calcium chloride is added to the mixed acid solution B to precipitate calcium fluoride (note paragraph [0021]).

The HF in JP '427 is considered as the "fluoride-containing effluent" as required in the instant claim 1. In JP '427, the fluoride-containing effluent (i.e. HF) is in combination with the HCl before adding the calcium chloride to form the calcium fluoride product, while the instant claim 1 requires that the fluoride-containing effluent and calcium chloride are separately added to the HCl in the reaction system. Since the calcium fluoride product cannot be formed until all three reactants, i.e. fluoride-containing effluent, HCl and calcium fluoride, are mixed, the difference between JP '427

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and the instant claim 1 is the order of adding the reactants. Ex parte Rubin , 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.) The pH of the "fluoride-containing effluent" is not seen as a patentable difference because regardless of what is the pH of the fluoride-containing effluent, the reaction is still being carried out by adding sufficient HCl to "maintain the pH at 1.5 or lower".

Since the original mixed acid solution contains HCl and during the process, HCl is additionally formed (from the reaction between the calcium chloride with HF to form calcium fluoride and HCl, note equation in paragraph [0022]), the pH of the process as disclosed in JP '427 would be low and it would have been obvious to one of ordinary skill in the art to optimize the pH of the process in order to effectively produce calcium fluoride from HF and calcium chloride.

Since the process of JP '427 has all the positive process steps as required in the claimed process, it would produce calcium fluoride particles having "a purity of 98% or higher"

For the reaction temperature, JP '427 does not disclose heating or cooling for the step of forming calcium fluoride by reacting the HF, HCl and the calcium fluoride, it is assumed that the reaction is carried out at room temperature.

In any event, for the reaction temperature and the particle size of the calcium fluoride product, it would have been obvious to one of ordinary skill in the art to optimize the temperature for the process to obtain the best results and it is known in the art to produce a precipitated product with large particle size so it can be easily separated from the remained solution.

The difference is JP '427 does not disclose the steps of producing calcium chloride from the HCl and recycling the calcium chloride to process of producing calcium fluoride.

Johansing '140 discloses a process for transformation of halogenated refrigerant gases (note title). The refrigerant gases react with oxygen and steam to form carbon dioxide and HF (note column 4, lines 11-33). Calcium chloride reacts with HF to form calcium fluoride and HCl (note reaction (d)). The HCl formed in reaction (d) is neutralized by the addition of purified calcium carbonate to form calcium chloride (note reaction (f)). HCl can also react with calcium hydroxide to form calcium chloride (note reaction (h)). The produced calcium chloride can be used in the formation of high purity calcium fluoride according to reaction (d) (note column 5, line 66 to column 6, line 3 and column 6, lines 15-18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to react the HCl, by-produced by the reaction between calcium

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chloride and HF to form calcium fluoride, in the process of JP '427 with calcium carbonate or calcium hydroxide to form calcium chloride which can be recycled back to the process producing calcium fluoride, as suggested by Johansing '140 because by doing so the cost of fresh calcium chloride can be minimized and the need to dispose toxic HCl can be avoided.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '427, optionally further in view of JP '498 as applied to claims 1, 3, 7, 9 above, and further in view of Ohmi et al (5,362,461).

The difference not yet discussed is JP '427 does not disclose that the calcium fluoride can be used to produce HF.

Ohmi '461 discloses that it is well known in the art to produce HF by reacting calcium fluoride with sulfuric acid (note chemical reaction 1 in column 3).

It would have been obvious to one of ordinary skill in the art to use the calcium fluoride produced by the process of JP '427 as the reactant to produce HF as suggested by Ohmi '461 because using a product of one process as the reactant for the process is well the skill of the artisan.

Applicant's arguments filed June 15, 2010 have been fully considered but they are not persuasive.

Applicants point to page 6, lines 8-9 for support for "pH 2 or lower" and Examples 1-6 for "pH 1.5 or lower".

From page 6, lines 8-9, the “reaction system under an acidic condition with hydrochloric acid” has pH of 2 or lower; however, this is considered as the original (starting) pH for the reaction system before the fluoride-containing effluent and the aqueous calcium chloride are added. For Examples 1-6, only the pH of the mother liquor (i.e. the ending pH after the reaction is completed). The values of the starting pH and ending pH do not provide clear support for “maintaining” the pH at “1.5 or lower”.

Applicants point to MPEP 2173.05(c)II where open-ended ranges are discussed.

It should be noted that this section discussed about the definiteness of the open-ended language, however Applicants' claim 7 is rejected under 112, first paragraph for lack of support (for the "at least 2.2%" limitation), not for being indefinite.

Applicants argue that claims 1 and 7 are now require the step of reacting the produced or residual quantity of hydrochloric acid with a calcium compound to produce an aqueous calcium chloride-containing liquid and the step of reusing the aqueous calcium-chloride containing liquid in the aqueous calcium chloride solution in the step of reacting the fluoride-containing effluent.

Johansing, Jr. '140 is applied as stated in the above rejection to teach these steps.

Applicants argue that Johansing, Fr. relates to a reaction in a combustor at extremely high temperature, which teaches against the claimed subject matter.

The high temperature as disclosed in Johansing '140 is only for decomposing the halogenated refrigerant gases (HGRs). Johansing '140 fairly teaches the reaction between calcium chloride with HF to form calcium fluoride and HCl (note reaction d),

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which is the same reaction as the reaction in paragraph [0013] of JP '427) and further teaches that the HCl is subsequently reacted with a calcium compound (note reactions f) or h)) to form calcium chloride that can be recycled back to reaction d) (note column 6, lines 15-18). Thus, it would have been obvious to one skilled in the art to react the HCl obtained in the reaction mentioned in paragraph [0013] with a calcium compound to form calcium chloride so that such calcium chloride can be recycled back to the reaction in paragraph [0013].

The rejection of claim 13 is maintained for the same reasons as stated above.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner can normally be reached on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/
Primary Examiner, Art Unit 1793

nmn
August 31, 2010